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Description: Procedure to Separate and Weld Individual Packages from a Thermoplastic Hose filled with Liquids

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Valer Flax, Vic-Fezensac, Gers (France) has been designated as the inventor.

It is already common knowledge to divide a longish piece of pipe, whose one end was previously sealed and whose other end is attached to a storage container into respective individual packages by movable molding clamps in order to enclose liquid and mushy substances through hermetical sealing. Due to the fact that the pipe consists of a relatively stiff material the molding clamps must be movable, thereby limiting the length of the pipe to be used.

Also, it is already known to produce individual packages from a hose which was made by welding together thermoplastic strips. The liquid to be packaged is moved into the longitudinally welded hose through a pipe while a constant liquid column is maintained before the welding clamps which perform the lateral welding. Due to the fact that the lateral weldings occur at the same intervals the same volume of liquid is measured off and the individual packages are filled equally taut. The disadvantage is that the procedure is cumbersome and requires complicated and therefore expensive equipment.

It has also been made known to produce individual packages from a thermoplastic hose which is filled with liquids. The basis is a longish piece of hose sealed on one end which is then filled with the liquid to be packaged. The filled hose is moved through a fixed pair of welding clamps which performs the individual lateral welding to separate the individual packages. The disadvantage is that the liquid column in front of the welding points does not remain constant, which means that the individual packages do not

contain an equal volume of the liquid to be packaged.

The invention at hand, which prevents these disadvantages, involves a procedure to separate and weld individual packages from a thermoplastic hose which is filled with liquids, characterized in that the hose, which is moved continuously or in steps, is moved over a support before the welding points which is positioned higher and separates the liquid contents into two columns.

Filling the hose on the one hand may occur without enclosing air so that the hose is flattened by the tension effect due to the liquid's weight in the area of the higher positioned support.

On the other hand, filling the hose may also occur by enclosing air whereby the enclosed air in the area of the higher positioned support is displaced and held there in the form of an air bubble.

The procedure according to the invention makes it possible to achieve an even filling of individual packages in the simplest way.

The invention is explained in more detail by the drawing. Shown are:

Fig. 1 a schematic view of the equipment which was used to perform the procedure according to the invention in which the hose is filled with the enclosure of air.

Fig. 2 a schematic view, where the hose is filled without enclosing air.

The thermoplastic hose 1 may be made, as is usual, either seamless or by welding strips together longitudinally. It may have a circular or other type of cross-section.

For efficiency, the pre-fabricated hose has a length of several dozen meters and is filled to almost its full length with the liquid to be packaged.

The back end of the hose is attached to a container 2 which contains the liquid (Fig. 1) or else it is provided with a valve 13 which permits the excess liquid which occurs when the individual packages are formed to exit into a container (Fig. 2).

The front end 3 of the hose 1 is sealed for instance by lateral welding. The hose may be wound around a drum 4 before or after filling from which it is gradually unwound.

Before the welding point, which is created by the welding matrix 5 the hose 1 runs over a higher positioned support 11 which is vertically adjustable. Preferably the support 11 consists of a roll 6 which is powered in order to move the hose 1 forward. The roll 6 may also be arranged such that it turns freely when the hose is

moved by an additional transport device. Starting at the support 11 the hose 1 runs downward for the length of several deci-meters in order to run horizontally through the welding matrix 5.

If the hose is filled with the enclosure of air and moved to its starting position the enclosed air rises, because it is lighter than the liquid, to the part of the hose 7 which runs over the support 11. The liquid in the part of the hose 9 which runs downward and the rising part of the hose 8 is divided by the air enclosed in the part of the hose 7.

Upon completion of each new lateral welding in the hose 1 by the welding matrix 5 the hose is moved forward which causes a small amount of liquid to flow from the rising part of the hose 8 into the part of the hose which runs downward 9 from the support 11. Therefore, the amount of liquid which is enclosed in that individual package which was sealed off last is constantly replaced. By adjusting the height of the support 11 to the speed of the hose movement the level of the liquid in the part of the hose 9 which runs downward may be maintained at the same level. This makes it possible to maintain the pressure of the liquid constant before the welding point so that all individual packages contain the same amount of liquid, provided that the hose is always moved forward by the same distance. Due to the fact that the height of the support 11 is adjusted the individual packages may be filled equally taut, and the pressure of the liquid may be adjusted to the various hose strengths, respectively.

According to the design example shown in Fig. 2 the hose 1 is filled without enclosing air. The hose 1 is then flattened in the area of the higher positioned support 11 by the tension effect caused by the liquid's weight. Here too the liquid columns in the two hose parts 8 and 9 are separated from each other and due to the hose's forward movement the liquid will flow from hose part 8 into hose part 9.

If foaming liquids such as shampoo and soap-like solutions are to be packaged it is advantageous to fill the hose without enclosing air because interfering foam would develop during the flow from hose part 8 into hose part 9.

Of course it is possible to perform the separation of individual packages by different manners of welding. In particular, molding clamps may be installed just before the welding clamps which briefly press the hose walls together without welding them together. These molding clamps close after each forward movement of the hose in order to tie off a short hose length. The welding clamps' effect prevents the liquid from flowing back. In addition, the welding matrix may be designed such that with each welding two or several adjacent individual packages are welded off from the hose, both in its longitudinal as well as in its lateral direction.

Patent Claims:

1. Procedure to separate and weld individual packages from a thermoplastic hose which is filled with liquids characterized in that the hose, which is moved continuously or in steps, is led over a higher positioned support, which divides the liquid contents into two columns, before the welding point.

2. Procedure according to claim 1, characterized in that filling the hose may occur without enclosing air so that the hose is flattened by the tension effect caused by the liquid's weight in the area of the higher positioned support.

3. Procedure according to claim 1, characterized in that filling the hose may occur with air enclosure and the enclosed air is displaced into the higher positioned support and held there in the form of an air bubble.

4. Procedure according to claim 1, characterized in that the height of the support may be adjusted which permits the adjustment of a desired constant liquid pressure before the welding point.

Publications which were considered:

U.S. Patents No. 2 166 643, 2 420 983;
Swiss Patent No. 17 078

Attachment: 1 Drawing